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INTEGRATED WATER MANAGEMENT DISTRICT:

MWRI PLAN FOR PILOT IMPLEMENTATION

REPORT NO. 62

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Water Policy Program
International Resources Group **Winrock International** **Nile Consultants**

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MWRI PLAN FOR PILOT IMPLEMENTATION

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The EPIQ Water Policy Reform Program (WPRP) is a joint activity of the Ministry of Water Resources and Irrigation and the United States Agency for International Development. It is carried out under the auspices of the Agricultural Policy Reform Program. Program implementation is the responsibility of Winrock International, International Resources Group, Ltd., and Nile Consultants.

In particular, the EPIQ/WRRP Chief of Party, the Senior Sociologist, and working group members, would like to acknowledge the contributions and support of the many senior officials of MWRI. Policy and technical guidance provided by the following individuals was significant and is greatly appreciated: Eng. Gamil Mahmoud, chairman of the MWRI Steering Committee and the MWRI Water Policy Advisory Unit; and Dr. Ross Hagan and Dr. Wadie Fahim Mankarious of USAID.

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The results, findings and recommendations of this activity supplement the benchmark report (EPIQ Report No. 49) on Integrated Water Management District (IWMD) of Tranche V.

Egypt is intent on implementing the IWMD policy in order to improve efficiencies in service coordination and management. Although IWMD is a major feature of irrigation delivery in many other countries, it is only now being launched in Egypt.

The major emphasis of this report is to examine the proposal made during Tranche V for the Integrated Water Management District pilot program in MWRI, and take necessary steps to assist MWRI with activating the program in the two pilot districts. The objective is to finalize the MWRI preliminary plan for implementing the IWMD model in the two designated pilot districts (i.e. Zifta and Ibrahamiya). Included in the final plan are 1) an achievable timeframe, 2) description of implementation tasks with designation of responsible parties, and 3) a general methodology for the monitoring and assessing of pilot district results for wider replication, 4) identify potential issues/constraints/bottlenecks that could hamper application of the implementation plan and recommend effective solutions that MWRI can apply to mitigate or prevent possible constraints as they arise, and 5) identify areas where MWRI will likely require additional TA in the future as the IWMD program implementation program expands.

The MWRI has a long-term goal to reorganize its internal functions and operations through a process of local consolidation and ministry-wide decentralization, including devolution of authority to the local level. Under present operational and administrative conditions, the management of services is handled through line department directives and functions emanating from the central ministry to lower line offices at the inspectorate and district levels. During the period of Tranche V implementation, i.e., January to December 2001, the objectives of a policy reform were to move toward the goal of reorganization of the MWRI internal functions and operations including devolution of authority to the local level thereby decentralizing water management and minimizing district-level inefficiencies and redundancies. Specially, the policy reform adopted under Tranche V related to this objective is: The ***GOE (MWRI) will adopt a policy to integrate all water management functions at the district level to support decentralized management.***

Two IWMD pilots were selected based on several critical criteria developed to consider most of the MWRI activities at the district level. One of the selected districts for the pilot IWMD program has a water board pilot program. Both districts are in Lower Egypt (Nile Delta region). The two pilot districts are:

1. South Zifta Irrigation District in the Menoufia Irrigation Directorate.
2. Ibrahimia Irrigation District in the West Sharkaiya Directorate.

In order to achieve an effective IWMD pilot model, it is important that the new district management officer have responsibility and authority to manage all water resources within the new district. The plan presented in Report No. 49 and as modified and further expanded under this present study, further emphasizes the necessity for administrative commonality.

The definition of what constitutes an Integrated Water Management District as developed by the IWMD Tranche V working-group is as follows: *The Integrated Water Management District is an entity that has sufficient manpower, material, and fiscal resources to operate and maintain all water resources under its jurisdiction. All of the divisions support the water distribution process to ensure that water is delivered equitably, resulting in the various district water entities currently being merged to constitute a single entity referred to as an IWMD.*

The Working Group for this study has determined that the organization of an IWMD should include four basic sections, one each for: water management and distribution, maintenance, planning and follow-up, and administration. These four sections are headed by the Markaz Officer. The Markaz Officer will be supervised by the General Director of the irrigation directorate, thus eliminating the need for the irrigation inspectorate tier. Under this organizational paradigm, there is a reduction in bureaucratic tiers since IWMD will become equivalent in authority and responsibility to an inspectorate.

From issuance of the Ministerial Decree No. 506 for year 2001 that recognizes the IWMD in Zifta and Ibrahimia, to the completion date of this study, the Irrigation Department has completed the following major activities: 1) appointment of the IWMD Officers in Zifta and Ibrahimia, 2) establishment of the hydrological boundaries of the pilot IWMDs, 3) preparation of the canal/drain maintenance plan as well as other maintenance plans for pumps and equipment, 4) preparation of official budget estimates for approval, and 5) final approval for consolidation of district line budgets under an umbrella line to be administered and controlled by the IWMD directorate.

In addition to the above achievements, a number of issues and constraints facing the implementation of the IWMD were identified, and reflect the output of comprehensive consultation meetings with the IWMD staff as well as with governorate and central level authorities. The primary issue areas include: 1) overlap of irrigation and drainage boundaries, 2) identification and selection of the IWMD officers, 3) IWMD budget allocation and operation mechanisms, 4) district staffing procedures, 5) lack of water monitoring programs, 6) lack of database and information systems, 7) lack of public awareness and communication programs, 8) need for an integrated operational program at the local level, and 9) delegation of authority and decision-making from general directorate level to the IWMD level. Solutions and suggested remedial actions necessary to prevent such issues from undermining the potential of the IWMD pilots are presented.

Regarding coordination among line departments, it has been agreed that the IWMD pilot programs will work closely with the Undersecretaries and General Directors to allocate the required budget and to transfer the components of maintenance budget to the concerned financial unit at the General Directorate for Irrigation. This earmarked budget would then be used specifically in the IWMD pilot areas. It has also been agreed that IWMD district staff will be appointed through a process of redistribution of existing staff of the "old" districts.

Coordination at higher levels is continuing between the Irrigation Department, EPADP, and MED to facilitate implementation of the IWMD and to resolve any inter-sectoral issues that

may arise. Organization charts indicating areas of responsibility of reporting linkages for the IWMD pilots are included, along with a revised timeline for pilot implementation.

List of Abbreviations and Acronyms

APRP	Agricultural Policy Reform Program
BCWUA	Branch Canal Water User Association
EPADP	(MWRI) Egyptian Public Authority for Drainage Projects
EPIQ	Environmental Policy and Institutional Strengthening Indefinite Quantity Contract
GOE	Government of Egypt
HCDWI	Head of the Central Directorate for Water Resources & Irrigation
HEPS	(MWRI) Horizontal Expansion & Projects Sector
IAS	Irrigation Advisory Service
IDS	Irrigation and drainage system
IIP	Irrigation Improvement Project
IIS	(MWRI) Irrigation Improvement Sector
IMT	Irrigation Management Transfer
IRG	International Resources Group, Ltd.
ISM	Irrigation Systems Management Project
IWMD	Integrated Water Management District
MALR	Ministry of Agriculture and Land Reclamation
M&E	Monitoring and Evaluation
MED	(MWRI) Mechanical & Electrical Department
NWRC	(MWRI) National Water Research Center
O&M	Operation and Maintenance
USAID	United States Agency for International Development
WPAU	Water Policy Advisory Unit
WPRP	Water Resources Results Package
WUA	Water User Association

1. Introduction

1.1 Overview

The Ministry of Water Resources and Irrigation (MWRI) is the primary government agency charged with the management of water resources in Egypt. Escalating population growth, a desire for agricultural expansion, and increasing demands on surface water supply play significant roles in water delivery capability. Both MWRI and USAID are aware of the need to develop policy reform that will effectively address these and other issues that determine utilization efficiency, productivity, and protection of water resources.

During FY 96/97 the MWRI and USAID developed a "water resources results policy package" that focused on producing four major results:

1) Improved irrigation policy assessment and planning process,
2) Improved irrigation system management,
3) Improved private sector participation in policy change, and
4) Improved capacity to manage the policy process.

The MWRI and USAID designed the water resources results package with the following objectives:

- To increase MWRI's ability to analyze and formulate strategies and policies related to integrated water supply augmentation, conservation and utilization, and protection of Nile water quality.
- To improve water allocation and distribution management policies for conservation of water while maintaining farm income.
- To recover the capital cost of *mesqa* improvements and establish a policy for the recovery of O&M costs of the main system.
- To increase users' involvement in system O&M.
- To introduce a decentralized planning and decision-making process at the irrigation district level.

In early 1997 the water resources results package was integrated into USAID's Agricultural Policy Reform Program (APRP). APRP is a broad-based policy reform program involving five GOE ministries (MWRI, Ministry of Agriculture and Land Reclamation (MALR), Ministry of Trade and Supply, Ministry of Public Enterprise, and Ministry of International Cooperation). APRP has the goal of developing and implementing policy reform recommendations in support of private enterprise in agriculture and agribusiness.

USAID supported the MWRI in five program activities under APRP. These five activities are: 1) water policy analyses, 2) water policy advisory unit, 3) water education and communication, 4) main systems management, and 5) Nile River monitoring, forecasting and simulation. USAID supports the Ministry's efforts through technical assistance and cash transfers (annual *tranches*) based on achievement of policy reform benchmarks.

Technical assistance for the water policy analyses is provided through a task order (Contract PCE-I-00-96-00002-00, Task Order 807) under the umbrella of the Environmental Policy and Institutional Strengthening Indefinite Quantity Contract (EPIQ) between USAID and a consortium headed by the International Resources Group, Ltd. (IRG) and Winrock International. Local technical assistance and administrative support is provided through a subcontract with Nile Consultants.

1.2 Purpose of Report

The major emphasis of this report is to examine the proposal made during Tranche V for the Integrated Water Management District pilot program in MWRI, review the present status, and identify necessary steps to activate the program in the two pilot districts.

The objectives of this study are: to finalize the MWRI preliminary plan for implementing the IWMD model in the two designated pilot districts (i.e. Zifta and Ibrahamiya), identify potential constraints to implementation, recommend solutions to overcome constraints and identify areas that require additional technical assistance.

1.3 Organization of Report

The remainder of this report is organized in five chapters as follows:

- Process review and present status.
- Implementation recommendations.
- Potential issues and constraints facing implementation.
- Performance indicators for monitoring and evaluation.
- Technical assistance requirements.
- Future consideration.

2. Process Review and Present Status

2.1 General

This study was initiated by forming a working group composed of staff from EPIQ, WPAU and MWRI (Irrigation Dept. and Ministers office). The working group commenced their effort by first reviewing the policy benchmark process as presented in EPIQ Report No. 49 in order to achieve a common background regarding IWMD. The remainder of this chapter summarizes the significant background gained from this review effort and the status of implementation at the beginning of this study.

An increasing number of countries recognize that in the complex arena of water management, the best services can be administered through an integrated package of services and practices, including irrigation, drainage, conjunctive water utilization, rainfall management and flood control. The MWRI has a long-term goal to reorganize its internal functions and operations through a process of local consolidation and ministry-wide decentralization, including devolution of authority to the local level. Under present operational and administrative conditions, the management of services is handled through line department directives and functions emanating from the central ministry to lower line offices at the inspectorate and district levels. During the period of Tranche V implementation, i.e., January to December 2001, the objectives of a policy reform were to move toward the goal of reorganization of the MWRI internal functions and operations including devolution of authority to the local level thereby decentralizing water management and eliminating district-level inefficiencies and redundancies. There were several significant achievements toward formalization of the IWMD plan. The most salient among these major achievements were:

1. The concept of exactly what an IWMD should be was developed from intensive discussions with MWRI staff at different levels (central, governorate, and district).
2. Two pilot areas were selected from the seven proposed districts. Each pilot district includes all MWRI activities and obtains water from the multiple sources: Nile system canal water, drainage system water, and groundwater.
3. Activities were initiated in both pilot districts to show how the IWMD policy is to be implemented. Modification of irrigation and drainage districts boundaries was made as the first step of implementation of the policy.
4. The Arabic name for IWMD: **??? ????????????? ???** This was selected by MWRI to replace usage of the term *IWMD*.
5. A water-monitoring plan was developed for implementation with the objective of ensuring that the IWMDs have the ability to integrate the various supply sources in a rational manner.
6. A ministerial decree was issued establishing the IWMD national policy effective 10 December 2001.

The Tranche V benchmark program was highlighted through achievement of the following policy reform objective:

The GOE (MWRI) will adopt a policy to integrate all water management functions at the district level to support decentralized management.

The district is the smallest unit of the MWRI hierarchy responsible for all operational management aspects within its domain. The district office is a governmental office similar to other localities that exists in the administrative district called "markaz". Due to the different activities conducted by the MWRI at the district level, such as irrigation activities, drainage activities, groundwater activities, *etc*., the MWRI had established separate specific entities for these activities. Usually there are two MWRI districts – an irrigation district and a drainage district. However, in some districts, a groundwater district and a mechanical and electrical district exist to take care of groundwater utilization and operation and maintenance of the pump stations, respectively. One purpose of an IWMD is to integrate all these various activities into a single district so as to facilitate efficient operation of the system and management of the water resources.

2.2 Definition of an IWMD

The definition of what constitutes an Integrated Water Management District as developed by the IWMD Tranche V working-group is as follows:

The Integrated Water Management District is an entity that has sufficient manpower, material, and fiscal resources to operate and maintain all water resources under its jurisdiction. As the primary responsibility of the district is to deliver water to the users, therefore, all of the divisions support the water distribution process to ensure that water is delivered equitably. As a result, the different water entities currently existing at the district level should be merged to constitute only one entity defined as an IWMD.

The developed organization of an IWMD includes mainly four sections. They are: water management and distribution, maintenance, planning and follow-up and administration. These four sections are headed by the Markaz Officer. The Markaz Officer will be supervised by the General Director of the irrigation directorate. This means that the Markaz Officer will not report to an irrigation inspector as is done currently by the irrigation district engineer. Therefore, the irrigation inspectorate may be removed from the organization, especially since the IWMD will become equivalent in authority and responsibility as a present inspectorate.

2.3 The IWMD Pilot Areas

Two IWMD pilots were selected based on several critical criteria developed to consider most of the MWRI activities at the district level. One of the selected districts for the pilot IWMD program has a water board pilot program. Both districts are in Lower Egypt (Nile Delta region). The two pilot districts are:

3. South Zifta Irrigation District in the Menoufia Irrigation Directorate.
4. Ibrahimia Irrigation District in the West Sharkia Directorate.

Below is a summary description of the conditions prevailing at each of the two pilot districts, prior to initiation of the IWMD activities.

2.3.1 South Zifta Irrigation Pilot IWMD District

South Zifta irrigation district is one of 3 districts that constitute the Zifta inspectorate. The Zifta inspectorate is one of 3 inspectorates included in the Menoufia irrigation directorate. The current command area of the South Zifta irrigation district is 42,360 feddans. The South Zifta district shares the water of three canals with two other districts: Quesna (55,110 feddans) and Berket Elsabaa (39,490 feddans). In addition to canal water, the district is using groundwater from nine wells scattered throughout the district. The wells are mainly located at the canal ends in order to compensate for insufficient canal flow.

The Zifta drainage district is 31,871 feddans and is responsible for maintaining the open drains and tile drains system. The area is totally covered with a tile drainage system and divided into five sub-regions. The area of the sub-regions ranges from nearly 3,300 feddans to 8,200 feddans. The boundary of the drainage district is different than that of the irrigation district. The coincidence of boundaries is estimated as 70%.

Zifta Groundwater District is a unit of the Mechanical and Electrical Department of the MWRI. The design discharge of each well is about 1,000 m^3/hour. (However, the existing discharge of each well has declined to be about 500 m^3/hour on the average.)

2.3.2 Ibrahimia Pilot IWMD District

The Ibrahimia irrigation district is one of two irrigation districts that constitute the Zagazig inspectorate. The Zagazig inspectorate is one of two inspectorates in the West Sharkia irrigation directorate. The current command area of the Ibrahimia irrigation district is 59,000 feddans. In addition to canal water, the district is proposing use of groundwater through 10 wells scattered throughout the district. It was found that many farmer wells exist in the Ibrahimia district and most of them are illegal, i.e., without proper permits.

There are two drainage districts in Ibrahimia overlapping with the irrigation district: the East Ibrahimia and the West Ibrahimia drainage districts. The area of the East Ibrahimia district is 41,100 feddans and that of West Ibrahimia is 37,500 feddans. The two district offices are in one building close to the Ibrahimia irrigation district building. The drainage districts are responsible for maintaining the open drains and tile drains system. The area of the sub-regions ranges from nearly 3,300 feddans to 8,200 feddans. The boundaries of the two drainage districts do not coincide with irrigation district boundaries. The coincidence of boundaries is estimated as 70%.

It is proposed to construct ten wells in the district to compensate for insufficient canal flow at the tail ends. The irrigation district (not the Mechanical and Electrical department) plans to operate these wells.

Establishment of water boards on two branch canals is presently planned for the Ibrahimia District. The water boards in Ibrahimia are part of a pilot program aimed at establishing

boards of water user representatives from different villages. The water boards are expected to participate in water management at the district level.

2.4 Issues Regarding IWMD Implementation

The issues described below were identified during the benchmark policy process.

2.4.1 Problem of Administrative Boundary Overlap

Irrigation and drainage district boundaries generally do not coincide. In order to achieve an effectively conceived IWMD pilot model, it is important that the new district management officer have responsibility and authority to manage all water resources within the new district. Hence, the boundaries especially for irrigation and drainage activities must agree as closely as possible under the IWMD approach. The plan prepared under Tranche V takes this issue into account.

2.4.2 Overlapping Administrative and Technical Responsibilities of District Staff

A civil engineer heads each district (irrigation or drainage) and is responsible for all operation and maintenance activities within the district. The district is divided into small entities each of which is headed by a technician who has a certificate from a technical school. The technician has some assistants to help him carry out his tasks. Irrigation and drainage districts have nearly the same staff and roles as listed in the following:

Irrigation & Drainage District Sections: Administration Section, Complaints Section, Personnel Section, Legal Affairs Section, Contractors Section, Bookkeeping (Archiving) Section, Telephone Operators, Gatekeepers, and Maintenance Crew

Groundwater District Sections: This district belongs to the Mechanical & Electrical Department. Therefore, it is headed by a mechanical engineer. At Zifta, the groundwater district has a number of mechanical engineers in addition to a number of technicians. The district is responsible for operation and maintenance of the groundwater pumps based on instructions of the irrigation engineer. The groundwater district has its own organization regarding administrative and personnel aspects.

Further, the irrigation district is supervised by an irrigation inspectorate. The Zifta inspectorate includes three irrigation districts. The Menoufia irrigation directorate consists of three inspectorates.

The irrigation district engineer is not involved in preparing the water distribution plan. The General Director of the directorate prepares this plan. The irrigation district engineer is responsible to distribute the water within his/her district for the branch canals according to the canal rotation table set by the General Director. The district engineer adjusts water levels in the canals to meet the farmer demands. In case of water shortage, he asks the General Director to provide him additional water. There is no routine measurement of canal discharges. The drainage water levels are recorded through reading the marble gauge at the head and outfall of each drain. There is no regular monitoring of groundwater – quality,

quantity pumped, and piezometric levels are not measured at the production wells or elsewhere in the aquifer. In most decisions, the district engineer must refer to the general director. Regarding operation of canals, the district engineer is not involved in the determination of canal water requirements and scheduling of water releases (the annual water allocation plan). Regarding canal maintenance, the district engineer determines the maintenance requirements such as dredging, removal of aquatic weeds, rehabilitation of structures, etc.

2.4.3 Training & Monitoring Needs

Computer management is needed urgently for monitoring and tracking and planning purposes. None of the existing districts have intensive water monitoring programs yet in place. In order for an IWMD to function most effectively, the new district should have a comprehensive monitoring plan covering all the various sources of supply and services.

A proposal for re-organization has been developed by the Ministry. This proposal considered the innovations of the district activities and MWRI plans and policies. The present study assesses these recommendations in terms of MWRI capabilities and future vision.

2.5 Present Status

The status of implementation at the start of this study (1 May 2002) was one of initial planning. The Irrigation Department had completed a review of the benchmark report and preparation of a draft timeline for implementation. A review of the pilot district boundaries had been started but was in the early stages.

3. Implementation Recommendations

The study working group, including the Head of the Irrigation Department, met several times during the study process to make assignments, review and discuss interim outputs and to formulate the recommendations presented below.

3.1 Organizational Structure

The benchmark working group evaluated the organizational structure required to implement the pilot integrated Districts. It should be noted that the pilot districts are 100% MWRI operated and controlled and therefore the management structure evolved from a reorganization of the existing MWRI structure. Chapter 6 of this report presents some considerations for implementation in districts where water user associations are existing and also some thoughts on how the pilot district operation could be modified in preparation for expected future conditions.

The recommended structure presented in the benchmark report was approved for adoption by H.E. the Minister and was made an attachment to Ministerial Decree No. 506/2001 that adopted the integrated water management district policy and established the two pilot districts. The IWMD general organizational structure approved by Decree 506/2001 is shown in Figure 3-1.

The general organizational structure assigns overall responsibility for implementation of IWM at the district level to the Head of the Irrigation Department. His role is to ensure that the required resources are made available in a timely manner, to monitor implementation to ensure timely execution, and to approve critical staff appointments. The local general Director of Irrigation is charged with providing direct supervision of the IWMD. The Markaz Water Resource Officer is the IWMD Officer responsible for all day-to-day operations of the IWMD.

The study-working group concurred with that general organizational structure but noted the urgency of nominating the Markaz Water Resources Officer in each pilot district because no implementation progress could be made without having that key position filled. This recommendation was conveyed to the Head of the Irrigation Department who acted swiftly. The Head of the Irrigation Department issued a decree on 23 April 2002 appointing senior irrigation engineers to fill the Markaz Water Resources Officer position in each of the pilot districts.

The benchmark-working group also prepared a detailed organization chart for the integrated district that demonstrates roles and functionality of the various sections. The study working group met and discussed that proposed structure with the responsible MWRI officials with the result that some minor revisions were identified and adopted. The final IWMD structure adopted by the Irrigation Department is shown in Figure 3-2. the functions of each of the four subsectors of the district are described in Appendix E of Report No. 49.

Figure 3-1

Approved Organization Chart for the IWMD

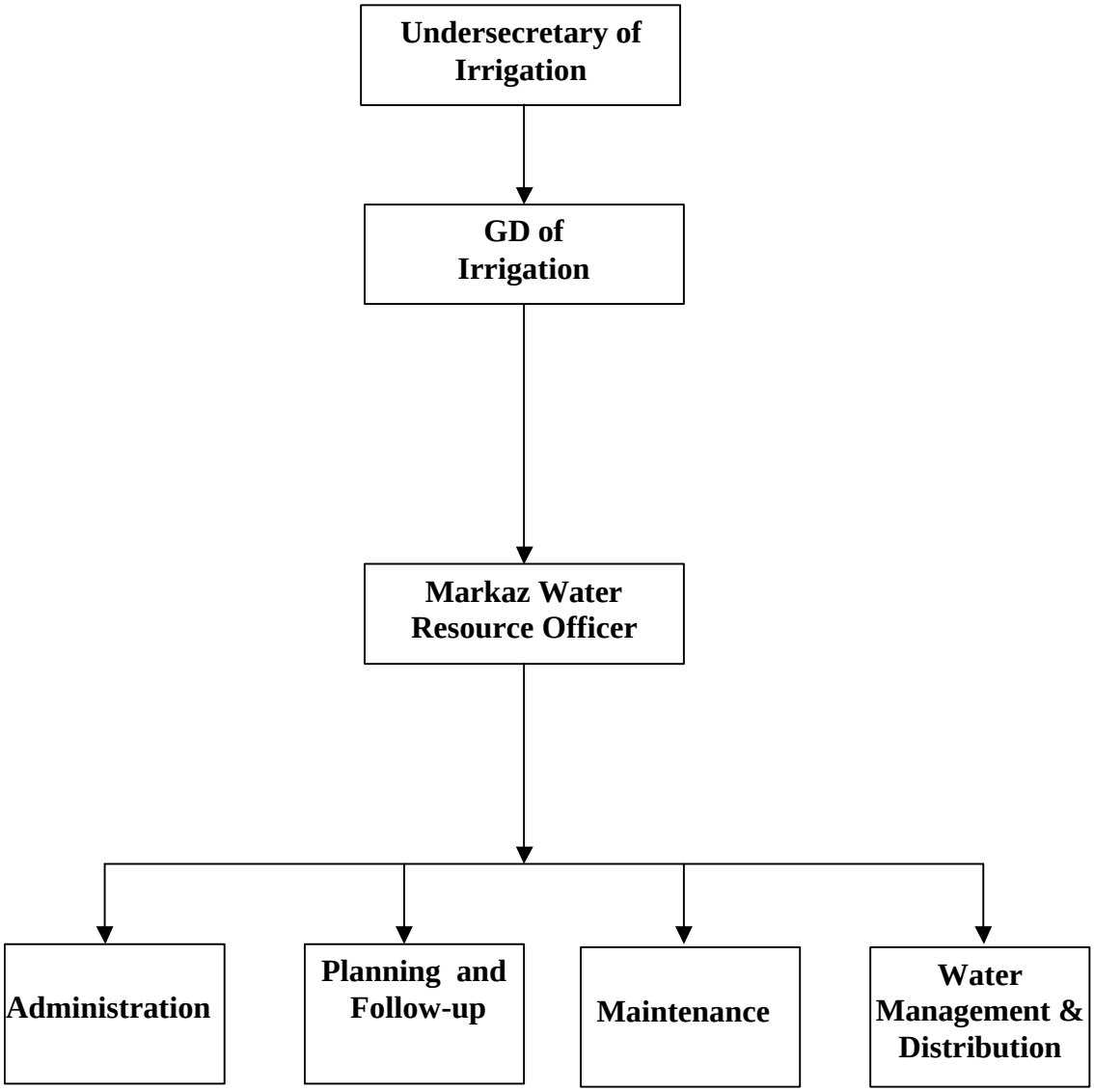
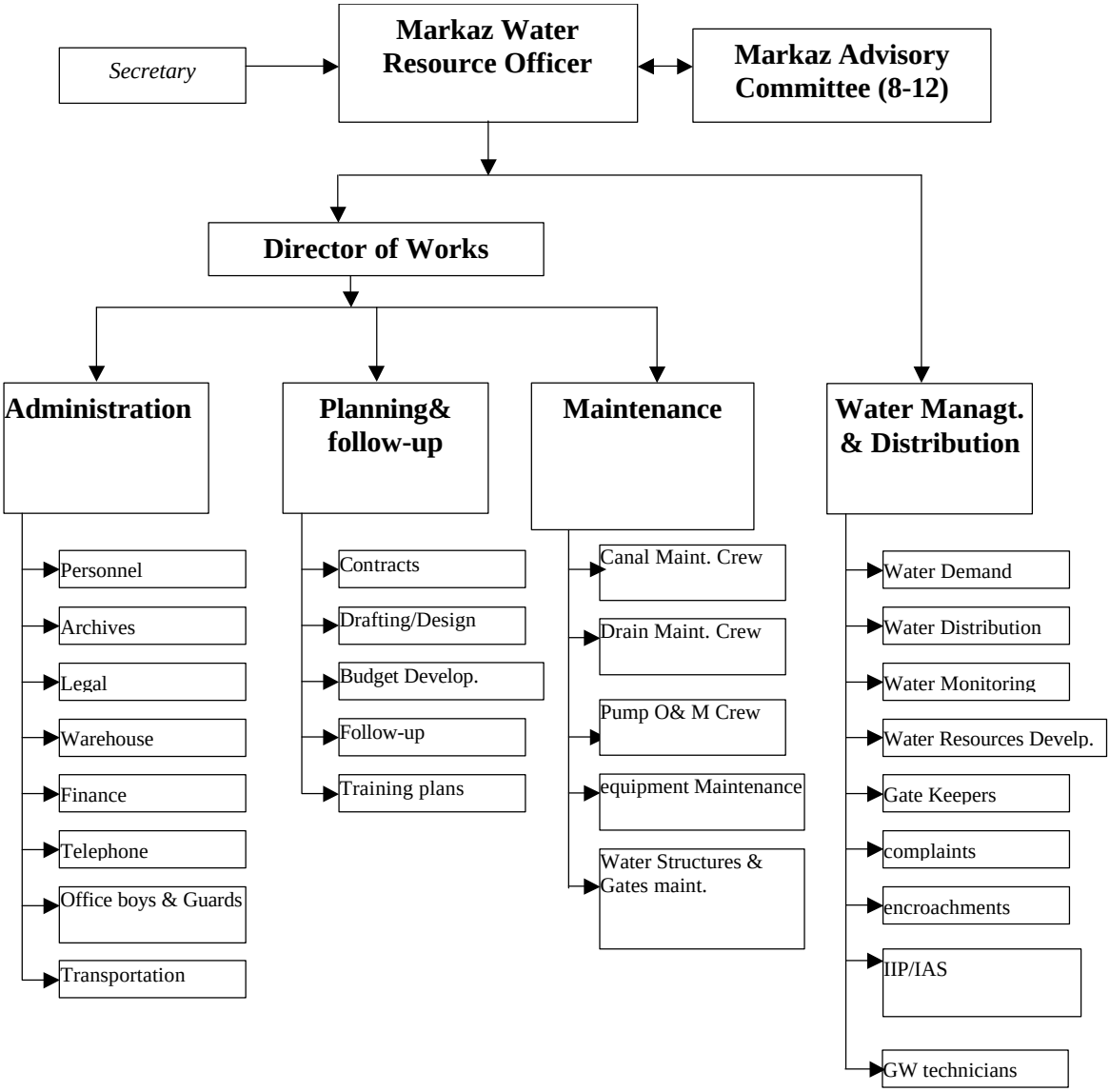


Figure 3-2: Approved IWMD Structure



3.2 Timeline

The Irrigation Department completed a draft timeline prior to commencement of the present study. The study working group reviewed the draft and also held discussions with the relevant department heads. As a result, a modified recommended timeline was prepared. A meeting with concerned MWRI departmental and sectoral heads regarding needs and expectations for the MWRI/IWMD plan and timeline was arranged by the study-working group. The meeting was chaired by Chairman of the Irrigation Department and attended by:

- Chairman of EPADP
- Chairman of M&E Department
- Chairman of HAD authority
- Head of Irrigation Sector
- Head of Groundwater Sector
- Deputy-Chairperson of NWRC
- Head of irrigation Improvement Project
- Head of Grand Barrages Sector
- Head of Nile Water Sector
- WPAU/EPIQ representatives

The plan for IWMD was discussed at the meeting and there was full agreement on the recommended time-line for the implementation plan. The timeline finally adopted is presented in Figure 3-3.

3.3 Establishing the Hydrological Boundaries of the IWMDs

The Irrigation Department staff, under the direct guidance of the Department Head and with input from the working group, conducted several meetings and communications with the IWMD officers to instruct them on finalizing the procedures for establishing the hydrological boundaries of the IWMD. These procedures included: (1) reviewing the previous work suggested by the EPIQ team, (2) proposing modifications through contact with the concerned MWRI departments at different levels, central, governorate and district, and (3) issuing the required ministerial decrees for establishing the final IWMD boundaries for the two pilot districts.

Figure 3-3 Timeline for IWMD Pilot Implementation

No.	Task	Year 2002											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Finalization of IWMD boundaries												
2	Prepare required maps and documents												
3	Assign roles and responsibilities for the IWMDs												
4	IWMD District staffing												
5	Provide the IWMD with suitable facilities (Building, PC,..)												
6	Provide the required equipments and transportation facilities												
7	Design and establish a comprehensive water monitoring program a. Water levels and quantity monitoring program b. Water quality monitoring program c. Canals/drains status monitoring program d. Design and establish an evaluation approach for water quantity and quality, water distribution, water availability												
8	Develop the integrated canal/drain maintenance plan												
9	Conduct suitable technical and administrative training												
11	Reallocate the financial budget to serve the IWMD activities												
12	Start preliminary evaluation of the performance of the IWMD												

Note:
The dashed lines *denote modifications adopted based on the study team's recommendations.*

3.4 Integrated Maintenance Program

With the assistance of the study-working group, the IWMD officers prepared the canal/drain maintenance plan as well as other maintenance plans for pumps and equipment. It has been agreed that the budget for all MWRI pilot IWMD districts will be combined and put at the General Directorate for Irrigation to be available for IWMD. Based on consolidation of the line-departmental plans, the designated IWMD Officer at the district level will have overall managerial responsibility and accountability regarding the budget. However, until regulations are revised, actual control of the budget will reside with the General Directorate.

3.5 Coordination Between MWRI Departments, Authorities & Sectors

In accordance with the structure of the IWMD, including irrigation, drainage and mechanical/electrical components, coordination between the concerned MWRI agencies is a critical element essential for a successful pilot. Many responsibilities, and numerous staff will be transferred from their original positions to the newly developed structure of the IWMD. In addition, existing budget lines currently allocated to line departments will be shifted to the new IWMD category. The study-working group recognized the need for such coordination to commence and facilitated meetings and communications to initiate effective coordination.

A meeting was held on 9 May 2002 chaired by the Chairman of Irrigation Department and attended by the undersecretary of irrigation, undersecretary of drainage, general directors of irrigation, general directors of drainage, newly designated IWMD officers, and WPAU/EPIQ team members. During these discussions a number of seminal issues were presented and solutions proposed, regarding possible bottlenecks to successful pilot implementation. It was agreed during this meeting that the IWMD pilot programs would work closely with the regions' Undersecretaries and General Directors to allocate the required budget and to transfer the components of maintenance budget to the concerned financial unit at the General Directorate for Irrigation. This earmarked budget would then be used specifically in the IWMD pilot areas. It was also agreed that IWMD district staff would be appointed through a process of redistribution of existing staff of the "old" districts.

Coordination at higher levels is continuing through monthly meetings between the Irrigation Department, EPADP, and MED to facilitate implementation of the IWMD and to resolve any inter-sectoral issues that may arise.

3.6 Monitoring and Evaluation

After the IWMD district is provided with the proposed staff and facilities and implementation at the pilot level is fully operational, it is expected to achieve the following targets:

- Improved water use efficiency
- Elimination of irrigation conflicts and disputes among water users

- Well-maintained irrigation and drainage system

Monitoring and Evaluation (M&E) of the pilot districts will be very important for decision-making regarding replication on a national scale. The M&E results should confirm the benefits to justify expansion, provide input for fine tuning the process prior to expansion and quantify the impacts and extent of goal achievement. The working group considered this requirement and arrived at the suggestions summarized below.

In order to test the policy targets, water monitoring and data collection programs are essential. The IWMD has already started (based on the instruction and orientation of the Irrigation Department) to establish water gauges at reference locations to assist in developing a water balance for the district that will reflect the water use efficiency within the IWMD. The water balance requires measurement of water inflow, water outflow, and water consumptions of the different uses. These parameters are being measured and recorded by the IWMD staff. However, there is still some lack of facilities and training to improve this process. The existing data are being used for analysis and baseline data.

Water conveyance efficiencies along the irrigation network will also provide an indicator of the success of the canal maintenance programs. Therefore, water levels, slope and measurements of flows at some locations are required.

The water distribution engineer in the IWMD structure (a new position) will be responsible, in addition to water distribution, for collecting any irrigation complaints and disputes that may arise in the district. The engineer will also be responsible for recording and logging complaints as well as remedial action taken to ameliorate the problem. These records will reflect the level of the water distribution management and also provide lessons that could be applied in order to eliminate complaints in the future.

It is expected that the sovereignty and integration of the canal/drain maintenance program as well as the maintenance of pumps and equipment will result in well-maintained network. Data collection on weed infestation, canal and drain cross sections and the timing of pump operating hours will be used to measure the relative performance of the proposed maintenance programs.

The above discussion presents some specific indicators that are recommended for the integrated water management district M&E program. The working group also recommends that EPIQ Report No. 59, Framework for Monitoring and Evaluation, be used as a guide in preparing the IWMD M&E plan.

4. Potential Issues and Constraints Facing IWMD Implementation

The study-working group conducted several meetings with members of the pilot IWMD staff, directorate officials and headquarters staff who play key roles in implementation of this policy. Important issues and potential constraints related to implementation were identified and discussed. A summary of the results and working group recommendations are presented below.

4.1 Issues

This category represents important issues that were faced during pilot implementation and that require action prior to implementation of integrated water management (IWM) in new areas. These issues are not presented here because they are considered roadblocks to implementation; they are presented below in matrix form as reminders of critical action items to be undertaken at the earliest possible time after a decision has been made to expand IWM to a new district. The issues presented in Table 4-1 arose during implementation of the pilot districts and were overcome but did require time for discussion and reaching agreement on the ultimate solution.

Table 4-1

Issues Related to Implementation of IWM

ISSUE	DISCUSSION
Establishing IWMD boundary	District boundaries for irrigation and drainage do not coincide under the present MWRI organization. Coincident boundaries must exist in an IWMD. The pilot districts experienced some resistance to modifying districts boundaries and intervention of the Heads of the Irrigation Department and EPAD was necessary to solve the issue. This demonstrates the need to start early and to maintain open and frequent communication.
Resistance to change.	Some resistance to change was experienced in the pilot districts but was easily overcome since the change was the result of a directive from H.E. the Minister. The study group recommends that an internal (within MWRI) awareness program be conducted prior to expansion. This program should: 1) Explain the need for change and expected benefits, 2) Present results from the pilot programs, 3) Explain the need for accurate M&E data collection, 4) Emphasize the need for cooperation and open communications.
Nomination of IWMD Officer	The IWMD Officer must be in place at they very beginning of implementation. Qualifications for this position in the pilot districts were: irrigation engineer with minimum of 15

ISSUE	DISCUSSION
	years experience. These qualifications should be reviewed, expanded and modified as necessary by the headquarters office for uniform application during expansion.
Need for an Integrated operational program.	Full implementation of an IWMD requires a comprehensive assessment of the districts' potential water resources and establishment of an integrated operational program for integrated utilization of surface, ground, drainage, rain, and treated wastewaters. Such a plan requires many components such as measurement of all waters used; data collection, achieving and retrieval; and monitoring & evaluation. Such a plan should be specific to each district and not general in nature. Thus, preparation of such a plan is complex and time consuming necessitating an early start of this activity.

4.2 Potential Constraints

This category represents issues that have the potential for delaying expanded implementation of the IWM policy if prior planning is not carried out. They are presented here in an effort to provide an "early warning" to management that IWM requires not only major institutional change, but also requires significant study, financial resources, and physical infrastructure for successful implementation.

The potential constraints, along with proposed probable solutions that were identified by the working group are presented in Table 4-2 below. It should be noted that these constraints did not arise in the two pilot districts, due primarily to the limited scale of the issues. However, when implementation nationwide takes place, the strain on MWRI resources will be magnified and the probability of adverse impacts on implementation are increased.

TABLE 4-2
POTENTIAL CONSTRAINTS TO IMPLEMENTATION

CONSTRAINT	POSSIBLE SOLUTION
Financial / Infrastructure Resources. Nationwide expansion of IWM requires measurement of water deliveries from groundwater pumps, canals, reuse pumps, and treated wastewater sources. Ideally, rainfall and evaporation measurements should also be made. Information management systems (hardware and software), transportation, communication and maintenance equipment will also be required. The total capital expenditure for startup requirements nationwide will be significant and may constrain implementation.	Using the two pilot districts as a basis, a capital cost estimate for nationwide expansion should be prepared. This estimate should consider existing infrastructure that is available to be transferred to the new organizational structure. MWRI management should then prepare a phased schedule for national implementation and include the required funding in the annual budget requests in a timely manner.

IWMD Budget. It has been recommended that each IWMD have and control its' own budget. Presently, there is a financial unit at the directorate level that includes a representative of the Ministry of Finance. Establishing a financial unit at the district level will require time and approval of the Ministry of Finance.	During pilot implementation, the various departments involved will allocate a portion of their budget to the IWMD pilots at the Irrigation Directorate financial unit. Based on the results of this financing model, it can either become the standard, or efforts to create a financial unit at the district level can be initiated.
Delegation of Authority. Although not considered a potential constraint to implementation, this issue could be a constraint to achievement of the policy goals. The IWMD Officer should be empowered with authority to make decisions and take actions quickly.	The authorities and responsibilities delegated to the IWMD Officers in the pilot districts will be in accordance with administrative regulations. Based on results of the pilot districts, necessary actions will be taken to invest the IWMD Officers with appropriate levels of authority to achieve efficient operation and achievements of the policy goals.

5. Additional Technical Assistance Requirements

The USAID funded IWMD policy benchmark process was oriented toward achieving an institutional policy reform to provide for integrated water management at the district level. The process addressed the institutional requirements of organizational structure (both near term and long term), functionality, and finance and budget. It also addressed various technical requirements in a broad sense. The process was appropriate for the objective (adopt a policy) but an in-depth analysis of implementation issues was not required, nor included. As noted in Table 4-1, an integrated operational plan must be developed specific to each district. Many aspects of such a plan will be common to all districts and the process of plan development will be common for all districts, however, each districts' plan will have some differences. MWRI is presently preparing such plans for the two pilot districts, however lack of staff with integrated water resources management experience will make the process inefficient and time consuming. Technical Assistance (TA) would greatly facilitate the process and contribute to the sustainability of this important policy. Specifically, the TA assistance would assist with:

- Development of a rational conjunctive use operational plan.
- Implementation of a water distribution, measurement and monitoring program for quantity and quality.
- Training of staff and/or local contractors in maintenance activities using appropriate technology.
- Establishment and implementation of a Monitoring & Evaluation program.
- Irrigation scheduling techniques to match supply with demand.

A second area requiring TA is capacity building through training. The most appropriate use of TA in this regard is primarily in course design. Execution of the training can be accomplished through MWRI resources supplemented with local training providers. Some critical course areas where TA input would be beneficial are:

- Computer use and database development.
- Irrigation scheduling.
- Conjunctive water supply management (surface, groundwater and reuse).
- Water quality monitoring and evaluation for reuse.
- Financial Management.
- Planning and scheduling.
- Conflict resolution.
- Contracting procedures and contract compliance monitoring (maintenance and system upgrades.

6. Organizational Considerations / Recommendations

Section 3.1 discussed the organizational structure of the two IWM pilot districts. It should be noted that the pilot districts are designed to test integration of functions within a traditional MWRI district. That is, the pilot integrated districts are 100% MWRI operated and controlled. As expansion of the integrated district takes place, and as the policy of Irrigation Management Transfer is expanded, future integrated districts will be water user operated and controlled. This will have a profound affect on the integrated district organizational structure as it is expected that more district functions will be done under contract and the district staff will be reduced significantly. For example, dealing with complaints and conflict resolution will become the responsibility of the WUA and not MWRI. Likewise, the WUA will be responsible for water distribution and canal/drain maintenance within the district, etc.

Table 6-1 presents a vision of the roles/responsibilities between MWRI and the WUA in a future integrated district after O&M is transferred to the water users. This vision represents a possible ultimate scenario that, if achieved, would most probably be accomplished through several intermediate steps.

TABLE 6-1
ROLES AND RESPONSIBILITIES IN A PRIVATIZED IMT DISTRICT

FUNCTION	RESPONSIBILITY	
	WUA	MWRI
Conduct WUA elections, meetings and other administrative matters	Total	Review for compliance with laws
Prepare Annual Budget	Total	Review
Prepare Financial Audits	Total	Review for compliance with laws
Assessment and Collection of Fees	Total	None
Conflict Resolution (within District)	Total	Intervene only when WUA fails to resolve
Allocation of Water to District	Provide input on cropping	Determine allocation
Distribution of Water Within District	Total	Monitor effectiveness
Prepare Annual Maintenance Plan for canals and minor structures	Total	Review & approve
Prepare annual maintenance plan for major structures	Review	Total
Procurement of maintenance services for major structures	None	Total
Replacement of Minor Structures	Total	Review & approve
Replacement of Major Structures	Request action	Total
Training	Ultimately-Total	Initially-Total
Monitoring and Evaluation	Some Data collection	Define plan, data collection, analysis, and reporting

MWRI is moving toward integrated districts with WUAs taking over O&M responsibility, and ultimately toward fully privatized integrated districts. Therefore, it would make the

future transition from 100% MWRI integrated districts to WUA operated integrated districts much simpler if the two pilot districts are operated to some extent as a district-level WUA would operate. That is, maximum use of private sector contractors to undertake the district O&M function. This would result in many benefits to the transition process. Some of the expected benefits are:

- Immediate reduction in the District staff requirements resulting in a more streamlined operation.
- Identification of potential problems that may be faced by WUAs in future such as training needs, staff requirements, contracting and contract administration issues, water distribution issues, etc. First hand knowledge of these potential problems will allow MWRI to plan appropriately to prepare WUAs to minimize/overcome them prior to take-over in future.
- Acquaint MWRI staff and top management with the needs and complexities of operating under the expected future conditions.
- Provide "real world" demonstration for awareness among stakeholders and private sector, including contractors, of benefits and opportunities under the concept of private sector operated, integrated water management district.
- Provides a more effective transition since MWRI has greater capacity to overcome the problems that are expected to arise under a private sector operated district. Effective solutions can be developed by MWRI in advance of turnover thereby reducing the possibility of major problems that have the potential to cause WUAs to fail when they take over O&M of an integrated district.
- Provide a more accurate assessment of costs that the WUAs will face in future.

It is recommended that the general organizational structure of the pilot integrated districts discussed previously be retained, however it is further recommended that the district be operated to maximize the use of private contractors and reduce the district staff levels accordingly.